

AIR COMMAND AND CONTROL AND SENSOR NETTING

BY SCOTT R. GOURLEY

Marine Air Command and Control System, Composite Tracking Network, and Common Aviation Command and Control System are now all part of AC2SN.

When it came under the PEO Land Systems umbrella just a few years ago, the Marine Corps' Common Aviation Command and Control System (CAC2S) program was nearing its planned Initial Operational Test and Evaluation (IOT&E) milestone. However, there were many who felt that the proposed solution still fell short of the capability desired by the service.

"With the CAC2S program coming into the PEO, Mr. [William] Taylor took a really critical look at it," explained Col. Rey Masinsin, Program Manager for Air Command and Control and Sensor Netting (PM AC2SN). "And he knew that it was just not going to make it. And that's why we had to restructure into our current two-phase effort."

Today, the restructured CAC2S is just one of the programs under the recently renamed AC2SN. Far more than just a name change, the new program office reflects an expanded portfolio that consolidates future capabilities with the legacy systems that they will ultimately replace.

"Based on an Decision Memorandum signed by Assistant Secretary of the Navy for Research, Development and Acquisition [ASN(RDA)] [Sean J.] Stackley earlier this year, the consolidation was intended to provide synergies of the legacy systems falling under the management of the modernization program manager, so that we can better and more efficiently use resources allocated for those systems," Masinsin said.

The new portfolio includes three major programs.

"The first is the Marine [Air] Command and Control System [MACCS] Sustainment Program, a collection of Abbreviated Acquisition Programs [AAP] that incorporates all of the legacy systems that are currently fielded in the operating forces," he said. "Second is the Composite Tracking Network [CTN], which is an ACAT III program. The CTN is analogous to the Navy CEC [Cooperative Engagement Capability] and is the Marine Corps' implementation of CEC. The third program is the Common Aviation Command and Control System (CAC2S), which is an ACAT IAC Major Automated Information System [MAIS] program that will replace several disparate fielded legacy systems out there being used within the Marine Air Command and Control System."

Asked about the systems that will be replaced by CAC2S, Masinsin pointed to legacy equipment in three different agencies.

"First is the Tactical Air Operations Center [TAOC], which is responsible for coordinating the anti-air warfare mission of the Marine Corps,"

he said. "CAC2S will replace the Tactical Air Operations Module [TAOM], which is already about 21 years old, as well as the TAOM's follow-on system called Mobile Tactical Air Operations Module. The next agency is the Direct Air Support Center [DASC], which is principally responsible for coordinating assault support and air support missions for the Marine Corps. CAC2S is a new system for the DASC. In the past, the DASC has been a manual agency that relied on paper maps and manual status boards for situational awareness. CAC2S provides the DASC with automated tools and data links, resulting in better awareness and efficiency. Finally, CAC2S will replace the legacy systems in the Tactical Air Command Center [TACC].

CAC2S provides the facilities for the Air Combat Element's command post and modernizes the tools for planning, monitoring, and executing the air battle plan. In addition, CAC2S upgrades the TACC's communications system from the old AN/MRQ-12 to the new AN/MRQ-13."

Reflecting on the CAC2S program restructuring that took place in 2009, Masinsin noted, "Our new acquisition strategy called for delivering the capabilities identified in our Capability Production Document [CPD] in two sequential phases. There are a couple of reasons that we took this approach. The first reason is that we wanted to minimize the technical risk to the program by initially going after the capabilities that are already mature and allowing more time

// CAC2S is envisioned as a scalable, modular, and flexible communications system with an open-architecture design that can be deployed via HMMWV within 24 hours of receiving a movement order. It is also supposed to be transportable by helicopters, airplanes, amphibious ships, and landing craft.



PEO Land Systems image



// William E. Taylor, PEO LS, meets with Marines of Marine Air Support Squadron 3, part of the 3rd Marine Aircraft Wing at Camp Pendleton, Calif., on Feb. 8, 2012, during Phase One fielding of CAC2S.

Noting that the new strategy also calls for using fielded systems as starting points for CAC2S Phase 1, he added, "So instead of us developing a new command post or developing a new communications system for aviation command and control, what we have done in the Marine Corps is to take the Combat Operations Center [COC], which is a currently fielded command post, as our starting point. Our task is to create a 'change kit' to upgrade that COC to make it into an air command and control system."

"We have an existing [command post] product already out there," he continued. "But it's not optimized for air command and control. We put in changes to make it optimized for air and ground C2 operations. That strategy not only reduces our technical risk but also provides cost avoidance by not having to buy new equipment."

"Likewise, for our communications subsystem we take our currently fielded AN/MRQ-12 and install modification kits that turn them into a more capable and improved AN/MRQ-13. The changes are fairly minor. Essentially the changes add more capabilities and markedly improve the system's information assurance posture," he said.

In addition to optimizing the current ground command posts for air and ground roles, the initial phase of CAC2S will significantly enhance situational awareness by incorporating both ground and air pictures.

As an illustration, Masinsin offered, "As it stands right now, in our air C2 agencies we have the air situation picture well developed. But what is absent is an integrated depiction of the ground picture. When we command and control air assets that are directly in support of Marine Air Ground Task Force operations, it's very important that we know exactly what the ground units are doing. So what we deliver in this first phase CAC2S capability is the combination of the ground picture and the air picture so that we can better develop synergies between the two."

"We are currently fielding CAC2S Phase One to the operating forces," he said. "We achieved the Limited Deployment Capability [LDC]

milestone in February of 2012 when we fielded to our formal schoolhouse at Marine Corps Communications-Electronics School and the first unit equipped, which is Marine Air Support Squadron 3, part of the 3rd Marine Aircraft Wing at Camp Pendleton, Calif. Our successful fielding to those two entities was our criteria for declaring LDC.

"We recently completed the CAC2S Phase One fielding to the 2nd Marine Aircraft Wing at Cherry Point, N.C.," he continued. "At Cherry Point, we delivered equipment to Marine Air Support Squadron 1 [MASS 1], Marine Air Control Squadron 2 [MACS 2], and Marine Tactical Air Command Squadron 28 [MTACS 28]. Then the next fielding will be to our overseas unit in Okinawa, Japan, commencing in the second quarter of FY 13."

Reiterating that the revised two-phase CAC2S strategy was "based on risk reduction and accelerated capability," Masinsin explained that the program plan for obtaining a Phase Two capability is through a competitive contract process that included an initial demonstration effort as a precursor to the Phase Two request for proposals (RFPs).

"During the demonstration phase we asked offerors to provide a prototype to demonstrate capabilities as identified in our CPD," he explained. "It's a 'come as you are party,' if you will. Basically we said, 'Here are our requirements. Under a fixed-price contract, build a prototype and demonstrate its capabilities against our CPD. The four contractors that participated in the demonstration phase include Boeing, Northrop Grumman, General Dynamics, and Thales-Raytheon."

"That demonstration is yet another risk-mitigation step for the program," he stated. "By having the contractors clearly demonstrate capabilities, we can gauge where certain technologies are as far as maturity to meet our requirements. We asked them to sign up and declare how much of our CPD, as a percentage, that each of the contractors can meet. To prevent an offeror from saying that they might be at 90 percent by leaving off the 10 percent that were the hardest capabilities, we made some of the harder capabilities mandatory during the demonstration. Those mandatory capability areas include track management and data fusion."

Masinsin said that the contractor teams each received one month at the Naval Surface Warfare Center Dahlgren System Integration Lab (SIL), where they were able to finish the development of their prototype

in a representative operational environment. Those sessions were then followed with a 10-day 'run for record' assessed prototype demonstration at the Marine Corps Tactical Systems Support Activity (MCTSSA) System Test and Integration Lab (STIL) at Camp Pendleton, Calif.

"We ran the contractor prototypes through increasingly more difficult scenarios to gauge their behavior and capabilities," he said. "And we also collected data on their performance. In addition, we asked the contractors to generate two studies for us during the demonstration phase. One is a transportability study that includes things like how they would propose to package the system. The second is an architecture study to surface the design and architecture of their prototype for us."

Following the closure of the demonstration phase, the program released the RFP for the Phase Two follow-on effort.

"This time we are going to use a fixed-price incentive contract with the competition restricted to the vendors that participated in the prototype demonstration phase," Masinsin said. "We are going to select one vendor to take us through the final design and fielding."

"One of the important things to note is that our evaluation and assessment of their performance during the prototype period was provided back to each vendor. The idea behind that is that they can, in turn, incorporate how they would attack any identified issues in their follow-on proposal," he added.

In general terms, the program anticipates a Phase Two contract award sometime in the fourth quarter of FY 12.

"While Phase One is fielding and tackling those 'less technically challenging' capabilities, in Phase Two we tackle the capabilities that are more technically challenging," Masinsin offered. "Examples include capabilities like Multi-Source Integration, which includes inputs from radars, data links, and the Composite Tracking Network, and then fusing all of that together to create a Common Tactical Picture. Another capability involves tying in sensors to include the G/ATOR [Ground/Air Task-Oriented Radar]."

"We are looking for a Milestone C for Phase Two in the fourth quarter of fiscal year 14 and anticipate an IOT&E [Initial Operational Test and Evaluation] for Phase Two in the second quarter of FY 15. The IOT&E results will then inform a Phase Two Full Deployment Decision Review with ASN(RDA) during the fourth quarter of FY 15," he added.

for the more technically challenging portions of the CPD to be developed. The second reason we adopted the two-phase approach is that we wanted to deliver militarily useable capabilities to the fleet as early as we can, because we have aging equipment out there.

"For Phase One there are two subsystems that we are deploying to the operating forces: the Processing and Display Subsystem, and the Communications Subsystem. The

Processing and Display Subsystem is the infrastructure and the computing environment for the system. It provides the physical command post facilities – the tents, chairs, tables, headsets – and the computing environment – the servers, routers, switches, and laptops used for visualization to the operating forces. The Communications Subsystem provides the radios and communications equipment for CAC2S."

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// Then-Program Manager CAC2S Capt. Pat Costello (center) accepts the Department of the Navy Major Acquisition Activity Award for the CAC2S program at a June 15, 2012, ceremony in the Pentagon as he is joined by members of the CAC2S program office; presiding officials include Under Secretary of the Navy Robert O. Work and Sean J. Stackley, Assistant Secretary of the Navy for Research, Development and Acquisition (ASN RDA). The award recognizes creative and effective practices that lead to lower costs and better technical performance.

He continued, "Now given that schedule, it means that I also have to sustain my legacy systems at least through the FY 16 – FY 18 period before I can 'sunset' them when I have enough CAC2S Phase Two capabilities fielded to the operating forces. We have to care for and feed those currently fielded systems. I have to keep the legacy systems relevant. That is the issue. If the Operating Forces get a call to support a contingency today, our systems must be relevant with capabilities that are interoperable with our sister services.

"The plan is to not introduce any more 'new capability' to legacy systems but focus on system safety, maintaining Information Assurance capabilities, and other relevance issues," he said. "For example, if my service partners out there implement a new message for Link-16, then I am expected to also implement that in my legacy systems."

Asked about any lessons learned that may have emerged from the recent prototype demonstrations, Masinsin acknowledged, "The employment concept is a little bit different than what the Marines are accustomed to. So as they accrue more 'run time,' if you will, using CAC2S in local exercises and force level exercises, operators and maintainers are not only developing more proficiency but also developing new tactics, techniques, and procedures [TTPs] that are different than they were accustomed to with the old system.

"But that's all positive," he said. "Again, as an example noted earlier in the DASC, they didn't have a digital air picture. So how do you fight the DASC now that you have an air picture? How much better are you? How much more efficient are you? And I submit to you that their situational awareness has increased probably tenfold and they are far more efficient and effective."

He added, "In the past you were relying on the aircrew to report that they were at Point A. In contrast, now operators in the DASC see that the aircrew really is at Point A. So if controllers have to deconflict fires, for

example, they are able to do that with confidence that the airspace is really clear of friendly aircraft before they let artillery shoot."

In addition to greater situational awareness of where assets are located in the air and on the ground, CAC2S will also provide the DASC with automated and collaborative tools that will facilitate the exchange of information and automate request processes for the Joint Tactical Air Request (JTAR), Assault Support Request (ASR), and MEDEVAC/CASEVAC missions.

"There's also some interest from the Air Force on this, because we pretty much have the same mission set," Masinsin acknowledged. "The Air Force uses the same hardware as the TAOM so they have the same issues with diminishing manufacturing sources and obsolescence. So they are looking to see if the solution we are developing might be of interest to them."

The success of the new CAC2S strategy was publicly highlighted on June 15, 2012, when Under Secretary of the Navy Robert O. Work and Stackley recognized a number of individuals and commands for outstanding acquisition practices with a combined cost savings to the government of more than \$2.5 billion.

PEO Land Systems' CAC2S Program Office (now AC2SN) earned the 2012 Major Acquisition Activity Award in recognition of "creative and effective practices that lead to lower costs and better technical performance."

"It is a point of pride for us that we have given money back to the department, to the tune of \$84 million, because of efficient program execution and 'should cost' application," Masinsin said.

"The story is that we went from the verge of cancellation in '08 to delivering capabilities in '12," he concluded. "And from program restructure to delivery of a Phase One solution to the fleet took just 25 months – all under ACAT I scrutiny and oversight. That clearly shows validity of the program office and PEO and the ability to recognize how to turn around problem areas and make them successful."